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METHOD AND DEVICE FOR SYNTHESIZING IMAGE

Patent Number: JP5122606

Publication date: 1993-05-18

Inventor(s): SOGABE YASUSHI; others: 01

Applicant(s): MATSUSHITA ELECTRIC IND CO LTD

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IPC Classification: H04N5/265; G01B11/00; G01B11/24; G06F15/66

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Abstract

PURPOSE:To easily and accurately synthesize plural images.
CONSTITUTION:By imaging plural images 1 and 2 to be joined so that they can be partially overlapped, obtaining a luminance value or the color difference between the end part of the joined images and an area 4 and joining the images so that an area 5 whose luminance value is 0 or whose color difference takes a minimum value can be overlapped, the images are synthesized. Since it is not required to accurately move and position an imaging device and an object of imaging in order to join plural images, the images can easily be synthesized, and furthermore, since a joint point is obtained by using the luminance value or color difference between the images, the images can accurately by synthesized without losing concanate property.

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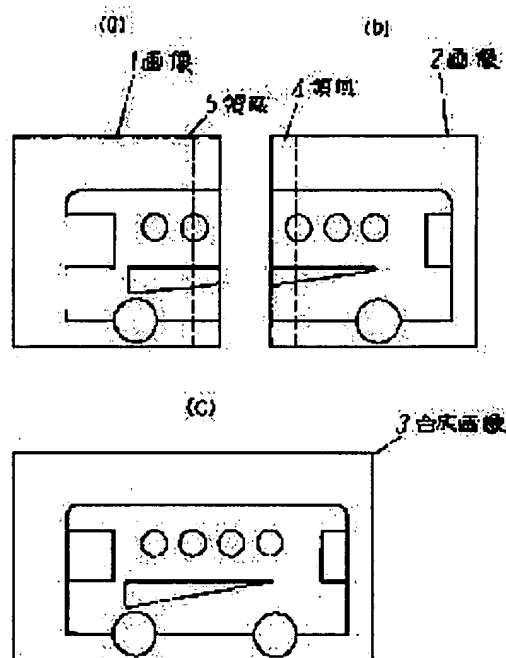(21)Application number : 03-284384   (71)Applicant :   MATSUSHITA ELECTRIC IND CO LTD
(22)Date of filing :   30.10.1991   (72)Inventor :   SOGABE YASUSHI
                                                          MURATA SHIGEKI

(54) METHOD AND DEVICE FOR SYNTHESIZING IMAGE

(57)Abstract:
PURPOSE: To easily and accurately synthesize plural images.
CONSTITUTION: By imaging plural images 1 and 2 to be joined so that
they can be partially overlapped, obtaining a luminance value or the color
difference between the end part of the joined images and an area 4 and
joining the images so that an area 5 whose luminance value is 0 or whose
color difference takes a minimum value can be overlapped, the images are
synthesized. Since it is not required to accurately move and position an
imaging device and an object of imaging in order to join plural images, the
images can easily be synthesized, and furthermore, since a joint point is
obtained by using the luminance value or color difference between the
images, the images can accurately by synthesized without losing concanate
property.

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CLAIMS

[Claim(s)]
[Claim 1] The picture composition art which joins a picture in the field to which the brightness difference or chromaticity difference of the picture of the junction edge of the picture which picturizes so that a part of picture to which the junction edge of the picture to join is joined in the image-processing method which joins the picture of two or more sheets picturized by the picture input device may be overlapped, and is joined, and the picture joined serves as the minimum.
[Claim 2] The picture composition art which joins a picture in the field to which the brightness difference or the chromaticity difference of the picture of the junction edge of the picture which is the picture composition art which joins the picture of two or more sheets which has a periodic pattern, picturizes so that a part of picture to which the junction edge of the picture to join is joined may be overlapped in the field of less than one period of the aforementioned periodicity pattern, and is joined, and the picture joined serves as the minimum.
[Claim 3] The picture composition processor which is a picture composition processor arranged so that a part of picture picturized by two or more picture input devices may overlap a ****** picture, and joins as a joint the portion from which the brightness difference or chromaticity difference of the picture of two sheets in a duplication field serves as the minimum.
[Claim 4] The picture composition processor join considering the portion the brightness difference or the chromaticity difference of a picture in the duplication field of the picture which is the picture composition processor which consists of move equipment which makes move the picture input device which picturizes a body, and the aforementioned body or the aforementioned picture input device in the direction perpendicular to the optical axis of the aforementioned picture input device, moved so that the aforementioned body before and behind movement may overlap in part in the visual field of the aforementioned picture input device with the aforementioned move equipment, and was acquired by the aforementioned picture input device before and after movement becomes with
[Claim 5] The picture composition processor join considering the portion which becomes with the minimum in the brightness difference or the chromaticity difference of a picture in the duplication field of the picture which is the picture composition processor which consists of a picture input device which picturizes a body, and rotation equipment which makes rotate the aforementioned picture input device to the circumference of the perpendicular direction of the optical axis of the aforementioned picture input device, rotated so that the image pck-up field before and behind rotation may overlap in part in the visual field of the aforementioned picture input device with the aforementioned rotation equipment, and was acquired by the aforementioned picture input device
[Claim 6] The picture composition processor which joins as a joint the portion from which the nearby brightness difference or nearby chromaticity difference of a picture characterized by providing the following serves as the minimum. The picture input device which picturizes the body which has a periodic pattern. The portion are the picture composition processor which consists of move equipment made to move the aforementioned body or the aforementioned picture input device in the direction perpendicular to the optical axis of the aforementioned picture input device, and overlap in the picture from which it moved so that it may become to the field of less than one period of the aforementioned periodic pattern, and the field where the aforementioned body before and behind movement overlaps in the visual field of the aforementioned picture input device with the aforementioned move equipment was obtained by the aforementioned picture input device before and after movement.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] this invention relates to the picture composition art and picture composition processor which join the picture of two or more sheets picturized by the picture input device, and are recorded on image recording equipment.
[0002]
[Description of the Prior Art] In recent years, also not only in an engineering field but in a medicine field, a dress-and-ornaments field, a living-conditions field, etc., measurement by the image processing and construction of an evaluation system are made, and it has become an important technical field. The picture of many pixels is searched for more as the number of pixels of a picture, i.e., the number of partitions of a picture, is one of the important factors which determines the resolution and precision of an image processing and an image processing becomes advanced in this image processing. For example, in high-density pattern detection of the lattice approach which analyzes a periodic pattern picture, a moire method, a resist pattern, etc., in order that the number of periodic patterns may determine a measuring power, the analysis of a picture which has more numbers of pixels is needed. however, the resolution of an input unit -- it is impossible to obtain the above resolution, in order to obtain more resolution, the same field is divided and inputted into the picture of two or more sheets, and the method of raising resolution is used
[0003] Moreover, like the object which cannot be picturized at once, for example, an audio tape and a VTR tape, since it is impossible to picturize at once the image pck-up of a body very long to a longitudinal direction and a picture required in the case of the stereoscopic camera which picturizes the scene of 360 degrees, it is necessary to input two or more pictures and to compound them also in this case.
[0004] In order to compound two or more pictures, the method of carrying out simple combination of the method (JP,2-130404,A) of detecting and compounding the focus of two or more ************ pictures for picture input devices and the picture of two or more sheets which moves an observation sample using a single picture input device, or ** moves a picture input device and is acquired, and compounding it was used.
[0005]
[Problem(s) to be Solved by the Invention] However, it has a trouble as shown below in above methods and composition.
[0006] (1) the case where the focus which can picturize the picture to compound so that a part may be overlapped mutually, can detect the focus contained in a duplication portion, and can be detected from the first in a picture about the method of joining a picture from the physical relationship does not exist -- a central theme -- the focus must be created in a picture-like and original image information is spoiled in the focus Moreover, though the focus exists from the first, an analysis person has to specify the position, and the hindrance of automation and the measurement error by the difference in an analysis person arise.
[0007] (2) Two or more picture input devices divide a measurement body, and it picturizes, in the method of joining simply and recording those pictures, two or more pictures cannot be found with a heavy bird clapper on the boundary, a picture input device must be arranged so that a boundary may moreover touch, and it becomes very difficult work to perform this positioning per pixel of a picture.
[0008] (3) In the method of joining simply two or more pictures which picturized the candidate for observation using the single picture input device by moving an image pck-up body or image pck-up equipment You have to move an image pck-up body or image pck-up equipment to the range part accuracy which can be picturized at once. Since the field which can be picturized changes with zoom scale factors when the sufficient positioning accuracy and sufficient repeatability for move equipment are required and a picture input device has a zoom function, whenever it changes a zoom scale factor, you have to calculate movement magnitude correctly.
[0009] this invention aims at offering the picture composition art and picture composition processor which, simple moreover, join two or more pictures with a sufficient precision in view of the above-mentioned trouble.
[0010]
[Means for Solving the Problem] In order to solve the above-mentioned trouble, the picture composition art and picture composition processor of this invention are picturized so that a part of picture of two or more sheets for compounding may be overlapped, they detect the brightness difference or chromaticity difference of the picture of the junction edge of one picture, and the picture joined, and compound the place where the difference serves as the minimum as a junction place.
[0011]
[Function] Simple moreover by the above-mentioned composition, this invention can compound two or more pictures with a sufficient precision.
[0012]
[Example] The picture composition art of the 1st example of this invention is explained below, referring to a drawing.
[0013] (Drawing 1) is the diagram having shown the picture composition art of this invention. In (drawing 1 (a), (b), and (c)), another [to which a picture is shown and 2 is joined] picture while 1 is joined is shown, and 3 shows the picture which compounded 1 and 2 and was acquired. 4 is a part of 2, it is a field for searching the position to compound, and 5 is a field

which shows the position a brightness value or whose chromaticity value corresponds with the field of 4 of 1.

[0014] (Drawing 1) is used for below and the picture composition art of this example is explained to it. Pictures 1 and 2 are pictures inputted by the CCD camera etc., as a part of candidate for an image pck-up is overlapped, and it is divided into a pixel and, in the case of the monochrome picture, in the case of the brightness stage and the color picture, has sexual desire news in each pixel. Here, it asks for the sum total of the difference between the pictures of the field 4 of the edge of the side which a picture 2 joins, and the field of the same size started one by one from the right end section of another picture 1. When a picture is monochrome, the value of each RGB 3 color which each pixel has using the brightness value of each pixel when a picture is a color is used for the difference between this picture.

[0015] Comparison with a field 4 is performed similarly, moving the field started from a picture 1 to the left for every pixel, and the sum total of a brightness value or a chromaticity difference searches the field which takes 0 or the minimum value. The synthetic picture 3 can be acquired by in the case of the obtained field 5, connecting a picture 1 and a picture 2 so that a field 4 and a field 5 may overlap.

[0016] In the example of **** 1, although the direction to join was made horizontal [a picture], it cannot be overemphasized that the same effect is acquired also in two or more pictures picturized by overlapping perpendicularly.

[0017] The picture composition processor of the 2nd example of this invention is explained below, referring to a drawing.

[0018] (Drawing 2) shows the picture composition processor in the 2nd example of this invention. In (drawing 2), 6a, 6b, and 6c are the television cameras for inputting the picture for compounding, and they are set up in parallel so that it may overlap in the picture composition direction and can picturize. 7 is the image processing system which compounds the picture of three sheets inputted from television cameras 6a, 6b, and 6c, and 8 is display which displays the compounded picture. 9 is a candidate for an image pck-up.

[0019] (Drawing 2) is used for below and the picture composition processor of this example is explained to it. The candidate 9 for an image pck-up is picturized with three television cameras 6a, 6b, and 6c. Television cameras 6a, 6b, and 6c are set up so that the field picturized may carry out specified quantity duplication, respectively. The picture incorporated with television cameras 6a, 6b, and 6c is stored in an image processing system 7, and is compounded using the picture composition method shown in the 1st example. Moreover, the compounded picture is outputted to display 8. Moreover, if the field picturized when a television camera has a zoom function and a zoom scale factor changes overlaps and television cameras 6a, 6b, and 6c are set as the state where it can input, it is not necessary to move television cameras 6a, 6b, and 6c at every zoom change.

[0020] In addition, although three television cameras have been arranged in series in (drawing 2), you may set up some television cameras at equal intervals mostly over parallel or two or more trains.

[0021] The picture composition processor of the 3rd example of this invention is explained below, referring to a drawing.

[0022] (Drawing 3) shows the picture composition processor in the 3rd example of this invention. In (drawing 3), 10 is a television camera for inputting the picture of two or more sheets. 11 is a rail for moving a television camera 10 to the longitudinal direction of a measurement body, and 12 is a candidate for an image pck-up. The image processing system with which 13 compounds a picture, the controller by which 14 controls the movement magnitude of a television camera 10, and 15 are the monitor TVs for observing the picture or the synthetic picture inputted into the television camera 10.

[0023] (Drawing 3) is used for below and the picture composition processor of this example is explained to it. Observing the picture picturized with the television camera 10 at any time with a monitor TV 15, a television camera 10 is moved to the longitudinal direction for [12] an image pck-up, and the picturized picture is sent to an image processing system 13. The move interval of a television camera 10 is determined by the following methods. First, the zoom scale factor of a television camera 10 is adjusted so that a desired field can be picturized. A television camera 10 is moved after that, observing with a monitor TV 15 so that a part of picture picturized may overlap. A controller 14 is made to memorize by using movement magnitude at this time as a move step. Henceforth, a television camera 10 moves for every move step of this by the controller 14, and repeats the process which picturizes a picture. The picture of two or more sheets acquired as mentioned above is compounded by the picture composition method shown in the 1st example within the image processing system 13. Moreover, the compounded picture can be observed with a monitor TV 14.

[0024] In addition, in this example, although how to move a television camera 10 was shown, needless to say, you may move the candidate 12 for an image pck-up.

[0025] The picture composition processor of the 4th example of this invention is explained below, referring to a drawing.

[0026] (Drawing 4) shows the picture composition processor in the 4th example of this invention. In (drawing 4), 16 is a television camera for inputting the picture of two or more sheets. 17 is rotation equipment for rotating a television camera 16 to the circumference of a direction perpendicular to the optical axis of a television camera 16, and the image processing system with which 18 compounds a picture, and 19 are the monitor TVs for observing the picture and the synthetic picture which were inputted into the television camera 16.

[0027] (Drawing 4) is used for below and the picture composition processor of this example is explained to it. Observing the picture picturized with the television camera 16 with a monitor TV 19, it rotates using rotation equipment 17 and a picture is picturized. The amount of rotation is rotated so that a part of visual field before rotation and visual field after rotation may overlap. The picturized picture is inputted into an image processing system 18, and is compounded by the method shown in the 1st example.

[0028] If the sum total rotating around a television camera 16 of an angle is made into 360 degrees or more, the acquired picture will turn into a panorama picture which compounded the picture of all the directions.

[0029] The picture composition art of the 5th example of this invention is explained below, referring to a drawing.

[0030] (Drawing 5 (a) and (b)) show a picture composition art in case the candidate for an image pck-up to join has a periodicity pattern, 20 shows the picture which has the periodicity pattern joined, and 21 shows the picture which has another periodicity pattern joined. 22 is a field for searching the position compounded with some periodicity patterns 21, and 23 and 24 show the field where a brightness value with a field 22 or the difference of a color takes 0 or the minimum value in a picture 20. 25 shows the duplication field which does not incorrect-judge a junction place.

[0031] (Drawing 5) is used for below and the picture composition art of this example is explained to it. the field where the difference of a field 22, a brightness value, or a color will serve as the minimum if a difference with a field 22 is searched for

in all the fields of a picture 20 in the case of a periodic pattern as the picture to compound showed to 20 of (drawing 5), and 21 -- two places of fields 23 and 24 -- existing . Therefore, it cannot specify which field is made into a junction place. Then, it is necessary to limit the field which is overlapped and is searched to some extent. If a code area is made into less than one period of a periodicity pattern, two or more junction candidate places will not be generated. Moreover, in order to enlarge the picture after composition as much as possible, it is required to lessen a duplication image pck-up field as much as possible. Then, the overlapping field is limited to the field 25 within one periodic pattern from the right end section of a picture 20. By doing so, the largest possible field that does not judge accidentally the field which should be joined and is moreover joined can be taken, and it is effective.

[0032] The picture composition processor of the 6th example of this invention is explained below, referring to a drawing.

[0033] (Drawing 6) shows a picture composition processor in case the candidate for an image pck-up to join has a periodicity pattern. In (drawing 6), 26 is a candidate for an image pck-up with the pattern which has periodicity. 27 is a television camera for inputting the picture of two or more sheets. 28 is a rail for moving a television camera 27 to the longitudinal direction for [26] an image pck-up, and the image processing system with which 29 compounds a picture, the controller by which 30 controls the movement magnitude of a television camera 27, and 31 are the monitor TVs for observing the picture inputted into the television camera.

[0034] (Drawing 6) is used for below and the picture composition processor of this example is explained to it. Observing a television camera 27 at any time with a monitor TV 31, it moves to the longitudinal direction for [26] an image pck-up, and the picturized picture is sent to an image processing system 29. The move interval of a television camera 27 is determined by the following methods. It adjusts so that the field of a request of the zoom scale factor of a television camera 27 can be incorporated first. After that, a part of picture picturized overlaps, and a television camera 27 is moved, observing with a monitor TV 31 so that a duplication field may moreover become less than one period of a periodicity pattern. A controller 30 is made to memorize by using movement magnitude at this time as a move step. Henceforth, a television camera 27 moves for every move step of this by the controller 30, and repeats the process which picturizes a picture. The picture of two or more sheets acquired as mentioned above is compounded by the picture composition method shown in the 5th example within the image processing system 29.

[0035] In addition, in this example, although how to move a television camera 27 was shown, needless to say, you may move the candidate 26 for a body image pck-up.

[0036]
[Effect of the Invention] As mentioned above, since according to this invention it is necessary to move precisely neither image pck-up equipment nor the candidate for an image pck-up in order to join two or more pictures, it is simple, and since a brightness value or a chromaticity difference is used and it moreover asks for a connection position between pictures, a picture can be compounded, without losing a continuity correctly.

[Translation done.]

* NOTICES *

TECHNICAL FIELD

[Industrial Application] this invention relates to the picture composition art and picture composition processor which join the picture of two or more sheets picturized by the picture input device, and are recorded on image recording equipment.

[Translation done.]

* NOTICES *

PRIOR ART

[Description of the Prior Art] In recent years, also not only in an engineering field but in a medicine field, a dress-and-ornaments field, a living-conditions field, etc., measurement by the image processing and construction of an evaluation system are made, and it has become an important technical field. The picture of many pixels is searched for more as the number of pixels of a picture, i.e., the number of partitions of a picture, is one of the important factors which determines the resolution and precision of an image processing and an image processing becomes advanced in this image processing. For example, in high-density pattern detection of the lattice approach which analyzes a periodic pattern picture, a moire method, a resist pattern, etc., in order that the number of periodic patterns may determine a measuring power, the analysis of a picture which has more numbers of pixels is needed. however, the resolution of an input unit -- it is impossible to obtain the above resolution, in order to obtain more resolution, the same field is divided and inputted into the picture of two or more sheets, and the method of raising resolution is used

[0003] Moreover, like the object which cannot be picturized at once, for example, an audio tape and a VTR tape, since it is impossible to picturize at once the image pck-up of a body very long to a longitudinal direction and a picture required in the case of the stereoscopic camera which picturizes the scene of 360 degrees, it is necessary to input two or more pictures and to compound them also in this case.

[0004] In order to compound two or more pictures, the method of carrying out simple combination of the method (JP,2-130404,A) of detecting and compounding the focus of two or more *********** pictures for picture input devices and the picture of two or more sheets which moves an observation sample using a single picture input device, or ** moves a picture input device and is acquired, and compounding it was used.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] As mentioned above, since according to this invention it is necessary to move precisely neither image pck-up equipment nor the candidate for an image pck-up in order to join two or more pictures, it is simple, and since a brightness value or a chromaticity difference is used and it moreover asks for a connection position between pictures, a picture can be compounded, without losing a continuity correctly.

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, it has a trouble as shown below in above methods and composition.
[0006] (1) the case where the focus which can picturize the picture to compound so that a part may be overlapped mutually, can detect the focus contained in a duplication portion, and can be detected from the first in a picture about the method of joining a picture from the physical relationship does not exist -- a central theme -- the focus must be created in a picture-like and original image information is spoiled in the focus Moreover, though the focus exists from the first, an analysis person has to specify the position, and the hindrance of automation and the measurement error by the difference in an analysis person arise.
[0007] (2) Two or more picture input devices divide a measurement body, and it picturizes, in the method of joining simply and recording those pictures, two or more pictures cannot be found with a heavy bird clapper on the boundary, a picture input device must be arranged so that a boundary may moreover touch, and it becomes very difficult work to perform this positioning per pixel of a picture.
[0008] (3) In the method of joining simply two or more pictures which picturized the candidate for observation using the single picture input device by moving an image pck-up body or image pck-up equipment You have to move an image pck-up body or image pck-up equipment to the range part accuracy which can be picturized at once. Since the field which can be picturized changes with zoom scale factors when the sufficient positioning accuracy and sufficient repeatability for move equipment are required and a picture input device has a zoom function, whenever it changes a zoom scale factor, you have to calculate movement magnitude correctly.
[0009] this invention aims at offering the picture composition art and picture composition processor which, simple moreover, join two or more pictures with a sufficient precision in view of the above-mentioned trouble.

[Translation done.]

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2. ******** shows the word which can not be translated.
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MEANS

[Means for Solving the Problem] In order to solve the above-mentioned trouble, the picture composition art and picture composition processor of this invention are picturized so that a part of picture of two or more sheets for compounding may be overlapped, they detect the brightness difference or chromaticity difference of the picture of the junction edge of one picture, and the picture joined, and compound the place where the difference serves as the minimum as a junction place.

[Translation done.]

* NOTICES *

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1. This document has been translated by computer.So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3.In the drawings, any words are not translated.

OPERATION

[Function] Simple moreover by the above-mentioned composition, this invention can compound two or more pictures with a sufficient precision.

[Translation done.]

EXAMPLE

[Example] The picture composition art of the 1st example of this invention is explained below, referring to a drawing.
[0013] (Drawing 1) is the diagram having shown the picture composition art of this invention. In (drawing 1 (a), (b), and (c)), another [to which a picture is shown and 2 is joined] picture while 1 is joined is shown, and 3 shows the picture which compounded 1 and 2 and was acquired. 4 is a part of 2, it is a field for searching the position to compound, and 5 is a field which shows the position a brightness value or whose chromaticity value corresponds with the field of 4 of 1.
[0014] (Drawing 1) is used for below and the picture composition art of this example is explained to it. Pictures 1 and 2 are pictures inputted by the CCD camera etc., as a part of candidate for an image pck-up is overlapped, and it is divided into a pixel and, in the case of the monochrome picture, in the case of the brightness stage and the color picture, has sexual desire news in each pixel. Here, it asks for the sum total of the difference between the pictures of the field 4 of the edge of the side which a picture 2 joins, and the field of the same size started one by one from the right end section of another picture 1. When a picture is monochrome, the value of each RGB 3 color which each pixel has using the brightness value of each pixel when a picture is a color is used for the difference between this picture.
[0015] Comparison with a field 4 is performed similarly, moving the field started from a picture 1 to the left for every pixel, and the sum total of a brightness value or a chromaticity difference searches the field which takes 0 or the minimum value. The synthetic picture 3 can be acquired by in the case of the obtained field 5, connecting a picture 1 and a picture 2 so that a field 4 and a field 5 may overlap.
[0016] In the example of **** 1, although the direction to join was made horizontal [a picture], it cannot be overemphasized that the same effect is acquired also in two or more pictures picturized by overlapping perpendicularly.
[0017] The picture composition processor of the 2nd example of this invention is explained below, referring to a drawing.
[0018] (Drawing 2) shows the picture composition processor in the 2nd example of this invention. In (drawing 2), 6a, 6b, and 6c are the television cameras for inputting the picture for compounding, and they are set up in parallel so that it may overlap in the picture composition direction and can picturize. 7 is the image processing system which compounds the picture of three sheets inputted from television cameras 6a, 6b, and 6c, and 8 is display which displays the compounded picture. 9 is a candidate for an image pck-up.
[0019] (Drawing 2) is used for below and the picture composition processor of this example is explained to it. The candidate 9 for an image pck-up is picturized with three television cameras 6a, 6b, and 6c. Television cameras 6a, 6b, and 6c are set up so that the field picturized may carry out specified quantity duplication, respectively. The picture incorporated with television cameras 6a, 6b, and 6c is stored in an image processing system 7, and is compounded using the picture composition method shown in the 1st example. Moreover, the compounded picture is outputted to display 8. Moreover, if the field picturized when a television camera has a zoom function and a zoom scale factor changes overlaps and television cameras 6a, 6b, and 6c are set as the state where it can input, it is not necessary to move television cameras 6a, 6b, and 6c at every zoom change.
[0020] In addition, although three television cameras have been arranged in series in (drawing 2), you may set up some television cameras at equal intervals mostly over parallel or two or more trains.
[0021] The picture composition processor of the 3rd example of this invention is explained below, referring to a drawing.
[0022] (Drawing 3) shows the picture composition processor in the 3rd example of this invention. In (drawing 3), 10 is a television camera for inputting the picture of two or more sheets. 11 is a rail for moving a television camera 10 to the longitudinal direction of a measurement body, and 12 is a candidate for an image pck-up. The image processing system with which 13 compounds a picture, the controller by which 14 controls the movement magnitude of a television camera 10, and 15 are the monitor TVs for observing the picture or the synthetic picture inputted into the television camera 10.
[0023] (Drawing 3) is used for below and the picture composition processor of this example is explained to it. Observing the picture picturized with the television camera 10 at any time with a monitor TV 15, a television camera 10 is moved to the longitudinal direction for [12] an image pck-up, and the picturized picture is sent to an image processing system 13. The move interval of a television camera 10 is determined by the following methods. First, the zoom scale factor of a television camera 10 is adjusted so that a desired field can be picturized. A television camera 10 is moved after that, observing with a monitor TV 15 so that a part of picture picturized may overlap. A controller 14 is made to memorize by using movement magnitude at this time as a move step. Henceforth, a television camera 10 moves for every move step of this by the controller 14, and repeats the process which picturizes a picture. The picture of two or more sheets acquired as mentioned above is compounded by the picture composition method shown in the 1st example within the image processing system 13. Moreover, the compounded picture can be observed with a monitor TV 14.
[0024] In addition, in this example, although how to move a television camera 10 was shown, needless to say, you may move the candidate 12 for an image pck-up.
[0025] The picture composition processor of the 4th example of this invention is explained below, referring to a drawing.
[0026] (Drawing 4) shows the picture composition processor in the 4th example of this invention. In (drawing 4), 16 is a television camera for inputting the picture of two or more sheets. 17 is rotation equipment for rotating a television camera 16 to the circumference of a direction perpendicular to the optical axis of a television camera 16, and the image processing

system with which 18 compounds a picture, and 19 are the monitor TVs for observing the picture and the synthetic picture which were inputted into the television camera 16.

[0027] (Drawing 4) is used for below and the picture composition processor of this example is explained to it. Observing the picture picturized with the television camera 16 with a monitor TV 19, it rotates using rotation equipment 17 and a picture is picturized. The amount of rotation is rotated so that a part of visual field before rotation and visual field after rotation may overlap. The picturized picture is inputted into an image processing system 18, and is compounded by the method shown in the 1st example.

[0028] If the sum total rotating around a television camera 16 of an angle is made into 360 degrees or more, the acquired picture will turn into a panorama picture which compounded the picture of all the directions.

[0029] The picture composition art of the 5th example of this invention is explained below, referring to a drawing.

[0030] (Drawing 5 (a) and (b)) show a picture composition art in case the candidate for an image pck-up to join has a periodicity pattern, 20 shows the picture which has the periodicity pattern joined, and 21 shows the picture which has another periodicity pattern joined. 22 is a field for searching the position compounded with some periodicity patterns 21, and 23 and 24 show the field where a brightness value with a field 22 or the difference of a color takes 0 or the minimum value in a picture 20. 25 shows the duplication field which does not incorrect-judge a junction place.

[0031] (Drawing 5) is used for below and the picture composition art of this example is explained to it. the field where the difference of a field 22, a brightness value, or a color will serve as the minimum if a difference with a field 22 is searched for in all the fields of a picture 20 in the case of a periodic pattern as the picture to compound showed to 20 of (drawing 5), and 21 -- two places of fields 23 and 24 -- existing . Therefore, it cannot specify which field is made into a junction place. Then, it is necessary to limit the field which is overlapped and is searched to some extent. If a code area is made into less than one period of a periodicity pattern, two or more junction candidate places will not be generated. Moreover, in order to enlarge the picture after composition as much as possible, it is required to lessen a duplication image pck-up field as much as possible. Then, the overlapping field is limited to the field 25 within one periodic pattern from the right end section of a picture 20. By doing so, the largest possible field that does not judge accidentally the field which should be joined and is moreover joined can be taken, and it is effective.

[0032] The picture composition processor of the 6th example of this invention is explained below, referring to a drawing.

[0033] (Drawing 6) shows a picture composition processor in case the candidate for an image pck-up to join has a periodicity pattern. In (drawing 6), 26 is a candidate for an image pck-up with the pattern which has periodicity. 27 is a television camera for inputting the picture of two or more sheets. 28 is a rail for moving a television camera 27 to the longitudinal direction for [26] an image pck-up, and the image processing system with which 29 compounds a picture, the controller by which 30 controls the movement magnitude of a television camera 27, and 31 are the monitor TVs for observing the picture inputted into the television camera.

[0034] (Drawing 6) is used for below and the picture composition processor of this example is explained to it. Observing a television camera 27 at any time with a monitor TV 31, it moves to the longitudinal direction for [26] an image pck-up, and the picturized picture is sent to an image processing system 29. The move interval of a television camera 27 is determined by the following methods. It adjusts so that the field of a request of the zoom scale factor of a television camera 27 can be incorporated first. After that, a part of picture picturized overlaps, and a television camera 27 is moved, observing with a monitor TV 31 so that a duplication field may moreover become less than one period of a periodicity pattern. A controller 30 is made to memorize by using movement magnitude at this time as a move step. Henceforth, a television camera 27 moves for every move step of this by the controller 30, and repeats the process which picturizes a picture. The picture of two or more sheets acquired as mentioned above is compounded by the picture composition method shown in the 5th example within the image processing system 29.

[0035] In addition, in this example, although how to move a television camera 27 was shown, needless to say, you may move the candidate 26 for a body image pck-up.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the diagram having shown the picture composition art of the 1st example of this invention.
[Drawing 2] It is the diagram showing the picture composition processor of the 2nd example of this invention.
[Drawing 3] It is the diagram showing the picture composition processor of the 3rd example of this invention.
[Drawing 4] It is the diagram showing the picture composition processor of the 4th example of this invention.
[Drawing 5] It is the diagram showing the picture composition art of the 5th example of this invention.
[Drawing 6] It is the diagram showing the picture composition processor of the 6th example of this invention.
[Description of Notations]
1 Two Picture
3 Picture after Composition
4 22 Field for searching a junction position
5 Field Which Shows Synthetic Position
6a, 6b, 6c, 10, 16, 27 Television camera
7, 13, 18, 29 Image processing system
8, 15, 19, 31 Monitor TV
9 12 Candidate for an image pck-up
11 28 Rail
14 30 Controller
17 Rotation Equipment
20 21 Picture which has periodicity
23 24 Field where the difference of a field 22, a brightness value, or a color takes 0 or the minimum value
25 Duplication Field
26 Candidate for Image Pck-up with Periodicity Pattern
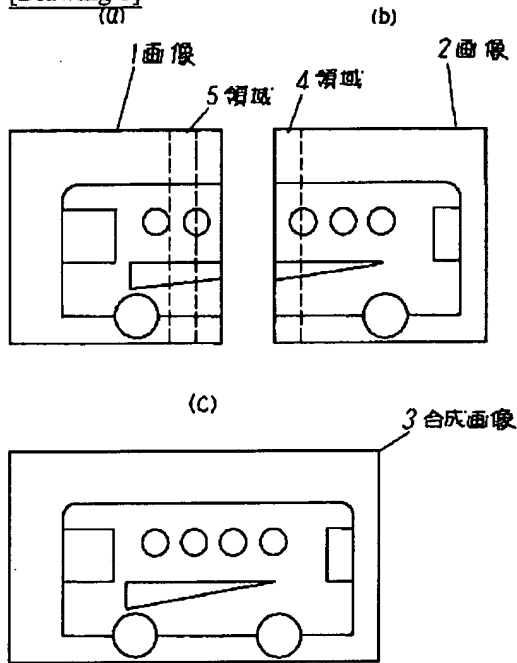
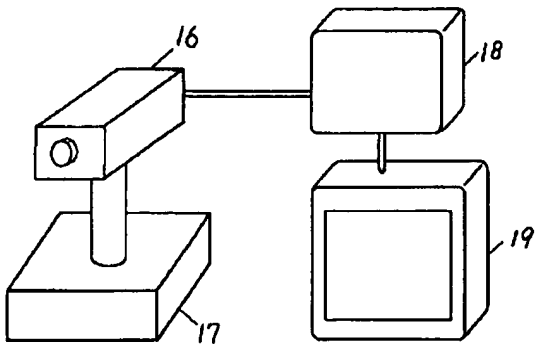[Translation done.]

DRAWINGS

[Drawing 1]

[Drawing 2]
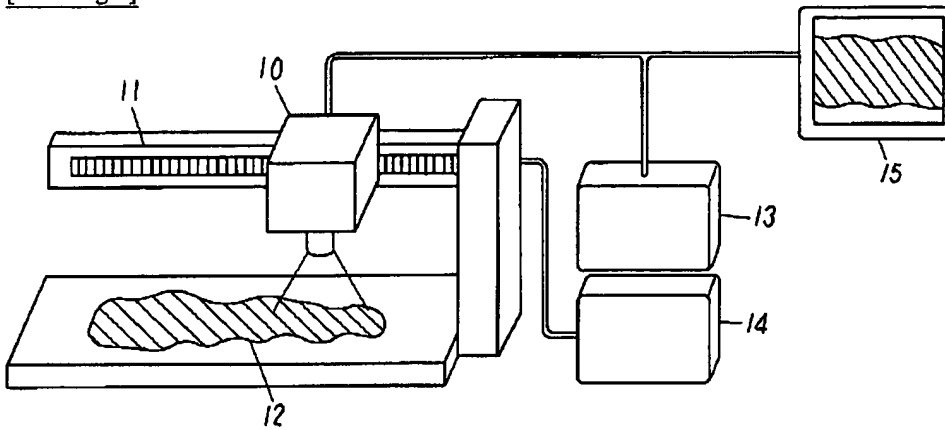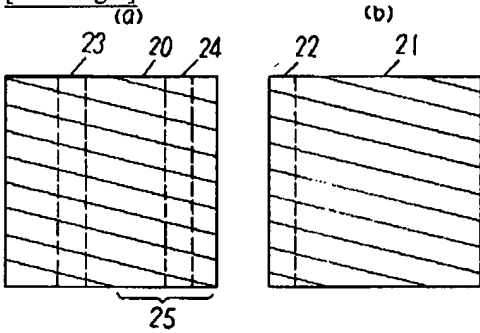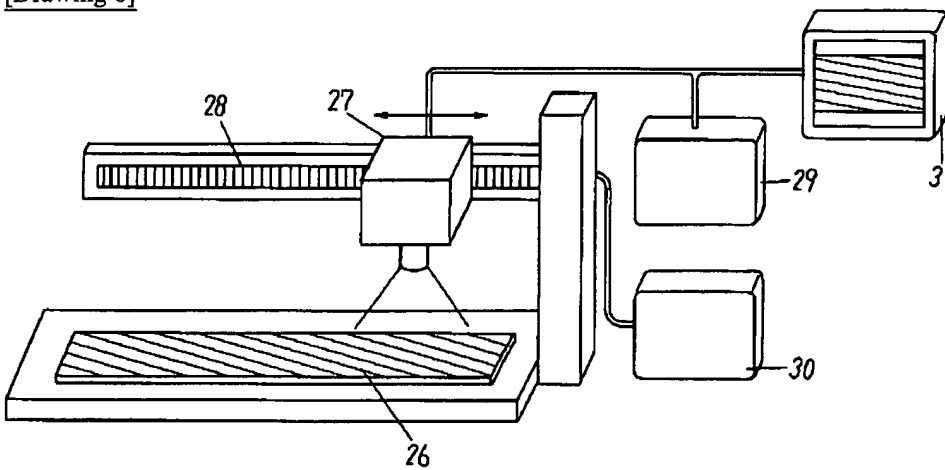

[Drawing 4]

[Drawing 3]

[Drawing 5]
(a)   (b)

[Drawing 6]

[Translation done.]